Killer Hardware Tips

Too Cool For Rules

If you're a user who can't leave things alone if there's a chance you can make them better, even if it means bucking the norm, read on. We have some tips and tricks that just might make you more productive.

There are myriad ways to interact with your computer, including via a keyboard, mouse, touch screen, joystick, or graphics tablet. Creative hackers go beyond these pedestrian input devices, however, to control their hardware in new ways. This month we take a look at a few unusual PC controls.

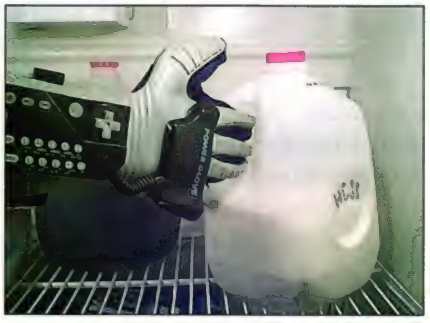
As Snug As A Glove

If you grew up in the '80s or have ever rummaged through the closet of someone who did, you're familiar with the Nintendo Entertainment System, the hugely popular game system that brought Mario to home televisions. You may not be as familiar with the PowerGlove, an NES add-on.

Released in 1989, PowerGlove was a virtual reality glove you could use to control games. The glove tracked the motion of your hand in 3D space using ultrasonic sensors and tracked finger positions (whether they were straight or bent) using strain gauges. Buttons near the wrist provided additional controls. (Only one game, a boxing title, was released specifically for PowerGlove.)

With a bit of hacking, however, you can modify a PowerGlove to work with your PC. Imagine gesticulating wildly as you use it to roam the 3D environs of a FPS or reach to move a virtual chess piece.

Check out this PowerGlove Web page at www.angelfire.com/ca7/mellott124/powerglove.htm. You'll find schematics for connecting the device to a PC's parallel port and a text version of the PowerGlove manual. Another parallel circuit diagram is available at www.xensei.com/users/ktakki/glove/pcglove.html. A serial interface version is available at www.realitydiluted.com/projects/vrstuff. An old (and largely obsolete) PowerGlove FAQ (www.spies.com/~jet/Projects/VR/faq-0.3.html) provides information about the glove's history.



Hacking a PowerGlove can be thirsty work.

(Image courtesy of www.devmage.com)

Because it hasn't been sold in a decade, finding a PowerGlove might be trickier than actually hooking it up. Units are often for sale on eBay for about $10 to $30. If you're persistent or lucky, you might find one at a local thrift store for less.

You'll also need software that's compatible with the PowerGlove—another treasure hunt unless you're willing to write your own. REND386, a free 3D rendering package, is one old but popular program that works with PowerGlove (http://www.ece.uwaterloo.ca/~broehl/rend386.html). Code for using the PowerGlove with Linux is available from Reality Diluted (www.realitydiluted.com).

Although the PowerGlove was probably an idea that was ahead of its time, you can opt for a modern version. Essential Reality's P5 glove (www.essentialreality.com) builds on PowerGlove's technology, featuring an optical tracking system that has six degrees of freedom and five independent finger measurements. It connects to a PC via a USB connection. Versions for PlayStation 2 and Xbox will be released next year for about an expected $150.

"The P5 glove is particularly well-suited for gamers because the majority of today's video games have a 3D user interface," the company states. The glove only works with games developed or modified to use it. Hitman 2: Silent Assassin, Tiger Hunt, and Beachhead 2002 are the first P5-enabled games. In addition, Essential Reality will release patches that add glove support to other games, such as Black and White.

If you wiggle your fingers, your computer will know with the P5 glove.

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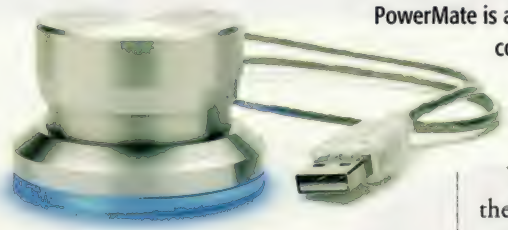

PowerMate is a knob you can use to control your computer's volume and mouse scrolling, plus play a mean game of Tempest.

Fly The Friendly Skies

Flight simulators are fun, but a keyboard and mouse are the polar opposite of a real airplane's interface. To make the experience more realistic, many flight-sim enthusiasts hook yoke and rudder pedal peripherals to their PCs. Flight Sim Central (www.flightsimcentral.com) offers a good selection.

Although this is a good start, true aviation junkies will want to check out the GF-AC Cockpit Control System from GoFlight (www.goflightinc.com). This PC control system offers knobs, toggle switches, levers, and displays like those found in real aircraft. You can manage your virtual aircraft systems, including avionics, autopilot, landing gear, and trim using realistic controls. The system—optimized for use with Microsoft Flight Simulator, Fly! II, and X-Plane—is modular; you can install any combination of control panels for a custom configuration.

"We have a pretty wide variety of customers. Retired airline captains are some of our biggest users, and we have some people who have never flown an airplane," says Doyle Nickless, GoFlight president. According to Nickless, most customers use four or five modules, each of which requires a USB port. The company sells enclosures in three sizes, including a full-height rack that holds as many as seven modules, a smaller rack for two, and a huge "flightdeck console" that holds 14.

I Have The Power

Even if the only software you fly is a Web browser, you can still have a sexy flight control at your disposal. The PowerMate from Griffin Technology ($45; www.griffintechnology.com) is a unique input device that can be useful no matter what software you use. In short, it's a shiny silver knob that connects to a USB port on your PC or Mac.

Use the configuration software to tell the PowerMate how to control various applications. For example, it can control the volume in your MP3 app, scroll up and down in your Web browser, act as a jog wheel in your video-editing program, or deftly move the paddle around for a game of Pong. In addition to rotating the knob, pressing down on it can perform mouse clicks or other actions. The knob is heavy and weighted well and can be a more comfortable way to scroll than using your mouse's scroll wheel.

Tempest on a vector monitor controlled by a PC.

Even if it didn't do anything, the PowerMate would be worth its price for its glowing blue base, which can emit an eerie, steady glow or pulse at a user-defined rate.

Vector Invader

After loading your computer with all these unusual input devices, here's an unusual output device to consider: a vector monitor. The Zektor Vector Generator (www.zektor.com) is a $299 card that lets your PC drive a vector display.

(A quick review: A raster monitor creates an image by illuminating rows of dots, doing so whether or not there's anything to see at that portion of the image. Your television set and computer monitor are raster displays. A vector monitor, also known as an X/Y monitor, draws just a few lines, only where the image is. Remember Asteroids? It used a vector display.)

The ZVG connects between a PC's parallel port and the analog X/Y inputs of the vector monitor. The card bundles the cables you need—just add a monitor. Salvaging a monitor from an old arcade game or searching eBay are the easiest ways to get one. The card can drive nearly every vector monitor made in color or monochrome.

Those using it are primarily classic video game players who want the unique look of vector graphics on emulated games. "There are a lot of enthusiasts out there who haven't had their fix of vector graphics in awhile," says Bill Paul, Zektor co-founder.

The creators of Retrocade, an arcade game emulator (www.retrogames.com/retrocade.html), have created a version that drives the ZVG card, so you can play Tempest, Lunar Lander, and other vector games. Support for MAME (www.mame.net) should come shortly, as Zektor has released the drivers as open source and will be releasing a full API for programmers.

"Quite a few people have expressed interest in developing all new games. Since we're going to have the full API available, this will allow people to write PC games that are vector-graphics-based. We're hoping to see a kind of vector graphics retro revolution," says Paul.

by Kevin Savetz

Infinite Loop

:-) Runs Longer Than Cats!

Twenty years ago, Scott Fahlman, an IBM researcher, gave birth to :-), the first emoticon. If Fahlman and other early emoticon adopters had sent :-) through postal mail rather than email and newsgroups, it would have cost just one 20-cent stamp. Other events from the year of :-)'s birth: *USA Today* launches, "Cheers" and "Late Night With David Letterman" first appear on television, the first users play the new game TRIVIAL PURSUIT, surgeons perform the world's first permanent artificial heart surgery, and the long-running Broadway musical "Cats" premieres.

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